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SCHOOL OF EDUCATION
INDIANA UNIVERSITY

Testing Services Offered by the Division of Research and Field Services

by
William H. Fox

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BULLETIN OF THE SCHOOL OF EDUCATION
INDIANA UNIVERSITY

Testing Services Offered by the Division of Research and Field Services

Announcement of the Testing Services Offered to Indiana Public Schools by the Division of Research and Field Services, and Suggestions for Utilizing These Services

by

WILLIAM H. FOX

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TESTING SERVICES OFFERED BY THE DIVISION OF RESEARCH AND FIELD SERVICES

FUNCTIONAL ASPECTS

BEGINNING with July 1, 1946, a number of services offered by the School of Education of Indiana University were consolidated within a new organization called the Division of Research and Field Services. These services include (1) assistance in carrying out comprehensive and building surveys of Indiana schools, (2) teacher placement service, (3) the research activities of the former Bureau of Cooperative Research and Field Service, and (4) the standardized testing service formerly carried out by the Bureau.

Purpose of the Present Report

In the present report the aim shall be to set forth the newly organized features of the standardized testing services offered to the public schools by the Division of Research and Field Services. Ways and means for fully utilizing these services will be discussed. A suggested minimum program will be offered and costs of such a program estimated. Some attention will be paid both to the principles involved in the selection of tests to be administered and to the establishment of desirable procedures in the utilization of test results. Criteria for the establishment of such principles and procedures are based on observations made over a long period of experience and research in standardized testing.

Scope of the Services

In the past a large number of public schools have availed themselves of the machine-scoring services of the Bureau. Also, assistance has been provided for many school systems in the planning and administration of standardized testing programs, and in the analysis and utilization of results from such programs. It is hoped that, with the present announcement and with the suggestions incorporated in this bulletin, many more communities will take advantage of the service.

The Division of Research and Field Services, in the test and measurement phase of its work, maintains a large staff of consultants and clerical workers. An IBM test scoring machine is available for the scoring of separate answer sheet tests. Other IBM equipment is available for the further processing of test results, and for statistical analyses. Research activities include experimentation with standardized tests primarily for the purpose of establishing their uses in evaluation of instruction and in the determination of the extent of individual differences. Other research is aimed at the construction and standardization of new tests. These services are available to all public schools.

Nature of the Services

One of the primary functions of the testing service is to provide aid to the public schools in planning and administering standardized

testing programs. A considerable amount of time is spent in field service throughout the state. Whenever the demand for planning service is not too urgent, it is usually possible for a representative to call upon school administrators in person, and at no expense to the school system. Special requests are fulfilled on a mileage and per diem expense basis; no charges are made for the consultant's time. The Division also welcomes visits from public school administrators and teachers, both to acquaint them with the operation of the service and to discuss mutually the testing problems characteristic of specific school situations.

Machine-scoring service is available to the public schools on a cost basis. In general, this may include any tests administered above the third grade level. Tests which are not machine-scorable will be scored by the Division upon request, but costs will be somewhat higher due to the fact that hand-scoring requires more time. Table I, which appears on page 5 of the present report, lists the tests which the Division is equipped to score, and gives information on costs for scoring.

The Division is equipped to place available norms on the answer sheets of machine-scored tests. As a general policy these norms are listed in the form of grade equivalents at the elementary level and of centiles at the junior and senior high school levels. Because of the increasing tendency on the part of Indiana public schools to avail themselves of these scoring services, it will be possible in the near future to establish state norms for most of the machine-scorable standardized tests.

The execution of individual psychographic profiles is a part of the testing service of the Division. This feature is also carried out on a cost basis. Such profiles are extremely useful in individual diagnosis and guidance. Graphic illustrations of such profile forms appear on pages 17, 19, and 20 of the present report.

Members of the staff of the Division of Research and Field Services are available for the administration of standardized tests. This service is expensive, since it involves travel and incidental expenses which must be borne by the school making the request. The policy is to provide such service only in special cases where no previous standardized testing has been carried on, and then only to the extent of administering enough tests under observation to serve as an in-service training for members of the local staff. The Division of Research and Field Services feels sincerely that the administration of the tests should be a local obligation and should, wherever possible, be carried out by those who teach in the areas being tested.

The public schools may request and receive statistical analyses of test results. Such analyses will be done by means of machine techniques, and may include measures of central tendency, measures of variability, measures of relationship, and item analyses. This type of service is strictly on a cost basis, the cost including both materials and clerical work. Ordinarily, through the use of machine facilities, the cost for such service is moderate.

Administrative Features of the Testing Service

In order that the scoring and other testing services may be utilized most effectively, it is necessary to establish certain definite rules and

regulations. The public school administrators and teachers are charged with the following responsibilities:

1. *To administer the tests.* Separate answer sheets are used with machine-scorable tests. Since no marks are made in the test booklets, the booklets themselves may be used over and over again for different groups. Special electrographic pencils are also a necessity in putting the answers on the answer sheets.
2. *To allow time enough for the pupils to check their answer sheets at the end of the test period.* Each mark on the answer sheet should be gone over the second time, so that it will be *heavy* and *black*. Each stray mark should be erased *cleanly*. Strict adherence to these two rules will result in a minimum of error in the scoring.
3. *To inspect the answer sheets further for double marks or any other discrepancies.* Occasionally pupils get confused on directions. Those who administer tests should allow such pupils the opportunity of taking again either the same test or another form of that test.
4. *To alphabetize and otherwise arrange the answer sheets according to the way the results are to be reported.* Large school systems will probably want to tabulate the test results by grades and by rooms. When the test papers are grouped this way originally, they remain in that order during the scoring and processing. Thus, schools may record the individual results more efficiently.
5. *To send the answer sheets by mail or express to the Division of Research and Field Services.* The costs listed in this bulletin do not include transportation of materials to and from the Division. This minor cost must be borne by the participating schools.

The responsibilities of the Division of Research and Field Services will be as follows:

1. *To provide consultation service in standardized testing upon request of any public school.* This service may include planning the program, helping determine the types of tests to be used, and setting up administrational procedures and suggestions for analyzing results.
2. *To make out test orders.* Upon receipt of the enrollment by grades, staff members of the Division of Research and Field Services will determine the amount of basic and expendable supplies necessary to carry out the proposed testing, and will inform the administrator as to where these supplies may be obtained and how much they will cost according to current catalogue price lists.
3. *To score the tests as quickly as possible after they arrive.* Scoring service in the past has been reasonably rapid. It is anticipated that, as the demand for this service increases, it will be necessary to allow more time for scoring the tests. The recommendations for the basic testing program which appear in the section of this report which deals with recommendations and costs take this fact into consideration in suggesting that certain grades be tested at variously designated times during the school

year. Such distribution of time will enable the Division to process all answer sheets in ample time to allow for full utilization of the test results. *Tests will be scored in the order in which they arrive.* When the processing has been completed, the answer sheets will be returned to the school by express C.O.D.

4. *To place norms on the answer sheet when this type of service is requested.* Since both national and state norms eventually will be available for most of the tests listed in this report, it is desirable that schools state the type of norms they want placed on the answer sheet.
5. *To construct individual profiles when this type of service is requested.* The psychographic profiles made out for each individual are highly effective as a basis for educational guidance. Schools are urged to take advantage of this part of the service whenever their testing budget permits. Profile forms will also be available, so that schools may execute their own profiles if they do not wish to spend additional money for this purpose.
6. *To carry out statistical analyses when requested.* Many of the larger schools will want to obtain statistical measures in order to compare school with school or group with group. With the aid of special calculators and IBM sorters and tabulators, the Division of Research and Field Services can usually provide this service at a lower figure than that involved when a school computes its own statistics.

THE TEST OFFERINGS

Machine-scoring services are somewhat limited in that not all tests are available in a machine-scoring edition. In general, however, a liberal offering may be made in tests of (1) general intelligence and aptitude, (2) general achievement, (3) specific achievement, and (4) personality and interests. In this bulletin, scoring costs have been computed only for those tests for which the Division has had requests in the past. *Any machine-scorable test which does not appear in this list may be scored by the Division upon request, providing keys are sent with the answer sheets.*

It should also be pointed out that the Division can provide service in the scoring of teacher-made objective examinations. The Division will, upon request, furnish information and advice concerning the construction, utilization, and scoring of this type of test.

Table I lists the standardized tests for which machine-scoring service is available. This table also lists the grade range of the tests, available forms, the publisher, the approximate amount of time needed for administering the tests, and the costs for two types of scoring service. Cost estimates do not include the cost of basic test supplies, special answer sheets, and special pencils. The tests are classified into categories, including (1) general intelligence, (2) aptitude, (3) general achievement batteries, (4) achievement in separate subjects, (5) personality inventories, and (6) interests and attitudes. Time limits in parentheses represent approximate over-all time for administration of the tests; time limits not in parentheses refer to actual testing time, in which case extra time should be allowed for instructions.

TABLE I. MACHINE-SCORABLE TESTS INCLUDED IN THE TEST SCORING SERVICE, TOGETHER WITH COSTS FOR VARIOUS TYPES OF SCORING SERVICE

Name and Level of Test	Grades	Forms	Publisher	Time	Per Pupil Cost	
					Scoring Only	Scoring and Norms
(1) GENERAL INTELLIGENCE						
A.C.E. Psychological Examination (High School)	9-12	1946	ACE	(60)	$.022	$.044
California Capacity	7-16	B	CTB	(30)	.022	.060
California Mental Maturity, Short Form (Advanced)	9-16	.....	CTB	(60)	.022	.060
California Mental Maturity, Short Form (Intermediate)	7-10	.....	CTB	(60)	.022	.060
California Mental Maturity, Short Form (Elementary)	4-8	.....	CTB	(60)	.022	.060
Otis Quick-Scoring, Mental Ability (Gamma)	9-16	Am,Bm	WBC	(30)	.008	.030
Otis Quick-Scoring, Mental Ability (Beta)	4-9	Cm,Dm	WBC	(30)	.008	.030
Pintner General Ability, Verbal (Advanced)	9-16	B	WBC	55	.065	.094
Pintner General Ability, Verbal (Intermediate)	4-9	B	WBC	55	.065	.094
Terman-McNemar, Mental Ability	7-12	D	WBC	40	.008	.030
(2) APTITUDE						
Iowa Algebra Aptitude (Revised)	9-10	.....	BERI	35	.008	.015
Iowa Plain Geometry (Revised)	10-11	.....	BERI	35	.008	.015
Mechanical Comprehension (Boys)	9-12	AA	PC	(25)	.060	.120
Mechanical Comprehension (Girls)	9-16	WI	PC	(25)	.060	.120
Minnesota Paper Form Board (Revised)	9-16	MA	PC	25	.060	.120
Survey of Mechanical Insight	9-16	.....	CTB	25	.008	.015
Survey of Object Visualization	9-16	.....	CTB	20	.008	.015
Survey of Space Relations	7-16	.....	CTB	15	.008	.015

TABLE I.—(Continued)

Name and Level of Test	Grades	Forms	Publisher	Time	Per Pupil Cost	
					Scoring Only	Scoring and Norms
(3) GENERAL ACHIEVEMENT BATTERIES						
Cooperative General Achievement						
I. General Proficiency in Social Studies	10-13	T	CTS	40	.008	.015
II. General Proficiency in Natural Science	10-13	T	CTS	40	.008	.015
III. General Proficiency in Mathematics	10-13	T	CTS	40	.008	.015
Complete Battery					.020	.040
Cooperative General Achievement						
I. A Survey in Social Studies	10-13	P	CTS	40	.008	.015
II. A Survey in Natural Science	10-13	P	CTS	40	.008	.015
III. A Survey in Mathematics	10-13	P	CTS	40	.008	.015
Complete Battery					.020	.040
Cooperative Tests for Grades 7, 8, and 9						
Social Studies	7-9	S	CTS	80	.030	.060
Science	7-9	R,S	CTS	80	.030	.060
Mathematics	7-9	Q,R	CTS	80	.036	.070
Complete Battery					.090	.180
Iowa Every-Pupil Test of Basic Skills						
A. Comprehension	5-9	O	HM	68	.020	.040
B. Work-Study Skills	5-9	O	HM	77	.045	.090
C. Basic Language Skills	5-9	O	HM	58	.045	.090
D. Basic Arithmetic Skills	5-9	O	HM	68	.030	.060
Complete Battery					.130	.260

Progressive Achievement						
Mathematics (Advanced)	9-13	B	CTB	(75)	.090	.160
Reading (Advanced)	9-13	B	CTB	(55)	.072	.130
Language (Advanced)	9-13	B	CTB	(35)	.068	.130
Advanced Battery					.220	.310
Arithmetic (Intermediate)	7-9	B	CTB	(70)	.072	.110
Reading (Intermediate)	7-9	B	CTB	(55)	.072	.110
Language (Intermediate)	7-9	B	CTB	(30)	.058	.100
Intermediate Battery					.170	.300
Arithmetic (Elementary)	4-6	B	CTB	(65)	.072	.110
Reading (Elementary)	4-6	B	CTB	(40)	.072	.110
Language (Elementary)	4-6	B	CTB	(30)	.042	.080
Elementary Battery					.175	.300
Stanford Achievement						
Arithmetic (Advanced)	7-9	Dm,Em	WBC	60	.014	.028
Language Arts (Advanced)	7-9	Dm,Em	WBC	60	.028	.056
Science (Advanced and Intermediate)	4-9	Dm,Em	WBC	15	.008	.015
Literature (Advanced and Intermediate)	4-9	Dm,Em	WBC	15	.008	.015
Social Studies (Advanced and Intermediate)	4-9	Dm,Em	WBC	30	.014	.028
Arithmetic (Intermediate)	4-6	Dm,Em	WBC	60	.014	.028
Language Arts (Intermediate)	4-6	Dm,Em	WBC	60	.028	.056
Complete Battery (Advanced and Intermediate)					.060	.120
Single Booklet Tests						
Cooperative Contemporary Affairs (High School)	9-12	1945	CTS	40	.050	.100
Gray-Votaw General Achievement (Abbreviated)	4-8	O	SC	75	.050	.100
Myers-Ruch High School Progress	9-13	Am,Bm	WBC	60	.008	.015

TABLE I.—(Continued)

Name and Level of Test	Grades	Forms	Publisher	Time	Per Pupil Cost	
					Scoring Only	Scoring and Norms
(4) ACHIEVEMENT IN SEPARATE SUBJECTS						
English						
Barrett-Ryan-Schrammel	9-16	Cm	WBC	40	.029	.058
Cooperative Mechanics of Expression	7-16	R,T	CTS	40	.008	.015
Cooperative Effectiveness of Expression (B-1)	7-12	R,S,T	CTS	40	.008	.015
Cooperative English (Usage, Spelling, Vocabulary)	9-16	Pm	CTS	70	.036	.070
Mathematics						
Cooperative General Mathematics (For High School Classes)	12-13	O	CTS	40	.036	.070
Cooperative Secondary School Mathematics	10-13	S	CTS	80	.008	.015
Cooperative Elementary Algebra (High School)	2nd Semester	Q,T	CTS	40	.008	.015
Cooperative Intermediate Algebra (High School)	3rd Semester	T	CTS	40	.008	.015
Cooperative Plane Geometry (High School)	2nd Semester	T	CTS	40	.008	.015
Cooperative Solid Geometry (High School)	1st Semester	P	CTS	40	.008	.015
Reading and Literature						
Cooperative Literary Acquaintance	9-16	Q,R	CTS	40	.036	.070
Cooperative Literary Comprehension	10-16	Q	CTS	40	.016	.032
Cooperative Literary Comprehension and Appreciation	10-16	T	CTS	40	.008	.015
Cooperative Reading Comprehension (C-1)	7-12	R,S,T	CTS	40	.036	.070

Cooperative Vocabulary (Complete)	7-16	R	CTS	30	.016	.024
Iowa Silent Reading (Advanced Revised)	9-16	Am,Bm	WBC	45	.058	.100
Michigan Vocabulary Profile	9-16	Am,Bm	WBC	(50)	.065	.130
Foreign Language Tests						
Cooperative French (Elementary)	1st-3rd Semester	X	CTS	40	.030	.060
Cooperative French Comprehension (Lower Level)	1st-4th Semester	S	CTS	40	.008	.015
Cooperative German (Elementary)	1st-3rd Semester	P	CTS	40	.030	.060
Cooperative Latin (Elementary)	1st-3rd Semester	R	CTS	40	.030	.060
Cooperative Latin (Advanced)	5th-8th Semester	R	CTS	40	.030	.060
Cooperative Latin (Lower Level)	1st-4th Semester	S	CTS	80	.030	.060
Cooperative Latin (Higher Level)	5th-8th Semester	S	CTS	80	.030	.060
Cooperative Latin Comprehension (Lower Level)	1st-4th Semester	S	CTS	40	.008	.015
Cooperative Latin Comprehension (Higher Level)	5th-8th Semester	S	CTS	40	.008	.015
Cooperative Spanish Elementary (Lower Level)	1st-3rd Semester	P	CTS	40	.030	.060
Cooperative Spanish (Advanced)	4th-8th Semester	Q	CTS	40	.030	.060
Science						
Cooperative Biology (High School)	2nd Semester	S	CTS	40	.008	.015
Cooperative Chemistry (High School)	2nd Semester	S	CTS	40	.008	.015

TABLE I.—(Continued)

Name and Level of Test	Grades	Forms	Publisher	Time	Per Pupil Cost	
					Scoring Only	Scoring and Norms
Cooperative General Science (High School)	2nd Semester	Q	CTS	40	.008	.015
Cooperative Physics (High School)	2nd Semester	S	CTS	40	.008	.015
Social Studies						
Cooperative American History (High School)	2nd Semester	T	CTS	40	.008	.015
Cooperative Ancient History	2nd Semester	Q	CTS	40	.008	.015
Cooperative Economics	2nd Semester	S	CTS	40	.008	.015
Cooperative Modern European History (High School)	2nd Semester	Q	CTS	40	.008	.015
Cooperative Test in American Government	2nd Semester	X	CTS	40	.008	.015
Cooperative World History	2nd Semester	X	CTS	40	.008	.015
Miscellaneous						
Health for High School Students	9-12	.....	CTB	(60)	.065	.130
Library and Study Materials	9-16	A,B	SC	40	.012	.124
Study Skills	4-9	A,B	SC	60	.008	.015

(5) PERSONALITY INVENTORIES

Bell Adjustment (Student)	9-16	.....	SUP	25	.034	.068
Bernreuter Personality	9-16	.....	SUP	(30)	On Request	
California Personality (Secondary)	9-12	B	CTB	(50)	.034	.068
California Personality (Intermediate)	7-10	B	CTB	(50)	.034	.068
California Personality (Elementary)	4-9	B	CTB	(50)	.034	.068
Minnesota Personality (Men)	11-16	.....	PC	(50)	.050	.100
Minnesota Personality (Women)	11-16	.....	PC	(50)	.050	.100

(6) INTERESTS AND ATTITUDES

Cleeton Vocational Interests Revised (Men)	9-16	A	M&M	(50)	On Request
Cleeton Vocational Interests Revised (Women)	9-16	A	M&M	(50)	On Request
Dunlap Academic Preference	7-9	B	WBC	(15)	On Request
Interests of High School Students	9-12	.....	BPTC	(30)	On Request
Kuder Preference Record	9-16	BM	SRA	(30)	On Request
Lewerenz-Steinmetz Orientation (Revised)	9-16	.....	CTB	(90)	On Request
Occupational Interests (Advanced)	10-16	.....	CTB	(40)	On Request
Occupational Interests (Intermediate)	7-12	.....	CTB	(40)	On Request
Strong Vocational Interests (Men)	12-16	M	SUP	(40)	On Request
Thurstone Vocational Interests	12-16	.....	PC	(20)	On Request

The costs listed in Table I are per pupil costs per test when the tests are given in small groups. Where the groups are large, there is a saving of time, since some of the scoring time is involved in adjusting and checking the scoring machine for each test to be scored. The Division of Research and Field Services can therefore offer the following discounts on the quoted costs when large numbers of the same test are scored at one time:

10 per cent when the groups range from 100-199
20 per cent when the groups range from 200 up

Schools will be given the advantage of these discounts and still report their test scores separately by grades or by schools, provided, of course, that they send all the answer sheets at one time and arrange them according to grade and school. For this reason, these discounts would be highly advantageous to counties carrying out their testing on a county unit basis.

Two factors enter into the variability in costs for testing service: (1) Tests vary in the number of part-scores to be derived; and (2) tests vary in the complexity of the scoring and the work entailed in the derivation of norms. These factors account for the differences in costs listed in Table I.

An initial letter coding system is employed in Table I to designate the publisher. The code letters and corresponding publishers are listed as follows:

ACE	American Council on Education 744 Jackson Place Washington 6, D.C.
BERI	Bureau of Educational Research and Service State University of Iowa Iowa City, Iowa
BPTC	Bureau of Publications, Teachers College Columbia University New York 27, New York
CTB	California Test Bureau 5916 Hollywood Blvd. Los Angeles 28, California
CTS	Cooperative Test Service 15 Amsterdam Avenue New York 23, New York
HM	Houghton Mifflin Company 2 Park Square Boston 7, Massachusetts
M&M	McKnight and McKnight 109-11 W. Market Street Bloomington, Illinois
PC	Psychological Corporation 522 Fifth Avenue New York 18, New York

SC	The Steck Company Austin 1, Texas
SRA	Science Research Associates 1700 Prairie Avenue Chicago 4, Illinois
SUP	Stanford University Press Stanford University, California
WBC	World Book Company 2126 Prairie Avenue Chicago 16, Illinois

Test catalogues published by the various companies listed above contain full test descriptions and price lists and are available from the publisher for the asking. If further information about any particular test is desired, an inquiry addressed to the Division of Research and Field Services will receive prompt attention.

Attention is directed again to the fact that machine-scorable tests may be administered with a minimum number of test booklets. The booklets may be used over again in various classes. For that reason it is impractical to attempt to estimate costs of basic supplies. Upon receipt of information concerning the number of students in the groups to be tested, the Division will determine the most efficient number of booklets to be ordered, and will estimate the cost of all needed supplies. Further explanation of possible ways of using these features of machine-scorable tests to economic advantage will be explained in the next section of the present report.

Machine-scorable tests also involve the use of special electrographic pencils. These may be purchased from the International Business Machines Corporation, Endicott, New York. The cost of such supplies, quoted from current catalogues, is as follows:

	Dozen	Gross
Wooden pencils	$1.00	$ 7.20
Mechanical Pencils	1.80	15.00

Special lead for refilling mechanical pencils	$ .70
Erasers for mechanical pencils	.70
	Per box of 72

Mechanical pencils have a distinct advantage over wooden pencils because they eliminate the necessity of sharpening, and also because they will last for a period of five to ten years. In general, it is recommended that the number of pencils purchased should slightly exceed the maximum number of students to be tested at any one time. This allows for substitution, in case something happens to a pencil during the testing period, without serious loss of time to the student taking the test.

RECOMMENDATIONS AND COSTS

The Division of Research and Field Services is constantly experimenting with various types of standardized tests in order to evaluate

their uses for school purposes. The testing service staff feels that it is not in conformity with best educational practice to become opinionated or biased toward any particular type of test or its usage. Open-mindedness and flexibility of judgment are of paramount importance in deciding what tests should go into a continuous testing program, and what tests should be replaced from time to time.

Expected Outcomes of a Testing Program

Briefly stated, the broader objectives to be achieved through the use of standardized test results are (1) to help in evaluating the extent to which various subject-matter achievement levels are being attained for the groups as a whole, and (2) to provide data for each student which may be used in individual guidance. Of these two objectives, the second is by far the more important.

In considering the question of developing a school testing program, the following purposes should be the goal: (1) To develop an adequate program which will be as thorough, as broad in scope, and as economical as possible; (2) to develop a program which is continuous in its operation, so that individual test records will be available for each and every student in the school system at any point in his school career; (3) to include the administration of an adequate number of tests covering any and all fields for which valid measures can be obtained; (4) to provide individual psychographic profiles for each student, which will serve as graphic representations of his tested strengths and weaknesses; (5) to develop a program which will require a minimum of teacher effort in processing the results; (6) to administer only those tests which are relatively free of complexity in interpretation.

More specifically, the objectives and outcomes of the standardized testing program may be clarified as follows:

1. *To help determine individual strengths and weaknesses in aspects of scholastic achievement.* An important aim of good teaching is to provide for the adequate treatment of individual differences. Teachers' marks and judgments, on the average, are not too reliable. The alert teacher welcomes the use of test records to aid in evaluating each pupil's ability, as well as in substantiating personal judgments arrived at by other means.
2. *To determine general scholastic aptitude.* Here, again, the value of standardized testing lies in the fact that the teacher may be able to utilize the measures in determining possible factors in below-average as well as above-average level of ability. The ratio between the intelligence quotient of the pupil and his actual achievement should provide, at least partially, an index of the industriousness of the pupil. The results of general aptitude testing are an important factor in helping the individual teacher to determine how the students may be grouped more homogeneously for instruction. Experiments in learning also utilize such results as one basis for the equating of groups.
3. *To provide the administrator with data for comparative purposes.* Administrators are always desirous of knowing how schools compare with one another in the various tested aspects of achieve-

ment and aptitude. Even though they should realize that test data do not as a rule reflect causal relationships, the objective record of such differences in schools suggests the starting point for further investigation to determine causes. All administrators should be interested in knowing how each school ranks with others of the same type, as well as how the situation in one grade compares with that in the other grades of his own school.

4. *To provide the administrator with an appraisal of grade placement of pupils.* Although other elements than standardized test results are to be considered in the problems of grade placement, these results serve as a check on the current situation. Research shows that, at the upper elementary grade levels, differences in the abilities of students as shown by test results are widespread. Not unusual is the situation wherein the range of abilities in subjects covers at least six or seven grade levels. Further research also shows that homogeneity attempted by a rigid retardation policy is not likely to affect this variability advantageously. It is better to treat individual differences by differentiating instruction. Test results should serve as one basis for determining the type and amount of differentiated instruction needed.
5. *To provide the teachers with a broad basis for evaluating their own instruction.* Progress is made through experimentation. Some experimentation, carefully done, is an essential of good teaching. Not all groups will respond alike to the same methods of teaching. Objective test results can be of assistance to the teacher in appraising her own methods of teaching.
6. *To provide counselors with a complete test record to be used in the individual guidance of each student.* The counselor will want to know everything about a student he is attempting to help. The trained worker in guidance can recognize trends in the individual's response repertoire if he is provided with a continuous record of the general aptitudes, general and specific achievements, interests, and personal and social characteristics of the individual as measured by tests. Many of these test results are of greater value in clinical use than in uses involving group diagnosis.
7. *To provide the individual pupil with a record of his progress in school subjects.* The use of standardized test results in the motivation of students has been rather widespread where adequate testing programs are in effect. A part of any testing program should be the plotting of an achievement psychograph for each student tested. This psychograph should be so constructed that it will show the student's position in each subject in relation to his tested general aptitude. Thus, he may see at a glance just where his strengths and weaknesses lie. With careful explanation by the teacher, such a device should become a potent factor in promoting better effort, better study habits, and better distribution of time for the student.
8. *To provide parents with a rating of the ability, achievement, interests, and other attributes of their children.* It is often

difficult for teachers to present to the parents objective evidence for their opinions regarding students. The psychograpns mentioned above should be of use in easing this difficulty. It is also expected that, when parents know more about the child's tested abilities, a more wholesome attitude toward schools will result and a more cooperative effort will be effected between the home and the school.

9. *To provide information to accompany the student's record in cases of transfer.* Since objectives and practices vary somewhat from school to school, an objective test record helps in the orientation and placement of a student who is being transferred from one school to another. These test records would be especially valuable at the eighth grade level, where many rural students are transferred to a consolidated high school at the beginning of the ninth grade.

10. *To provide information about high school graduates for colleges and industry.* Colleges and universities have a general policy of requesting test results and other types of evaluative data for the students who apply for admission. Industries are now very "test-minded," and are increasing their requests for test information.

Psychographic Tabulation of Test Results

Figure 1 represents a graphic way of showing the tested attributes of an elementary school student. The tested aspects are those listed in the suggested minimum program, which will be discussed later. The data listed in this figure are purely hypothetical, and probably represent a greater homogenity of tested abilities than would the normal finding.

This type of record enables the teacher to gain an almost instant appraisal of the abilities of the student in question. The record allows for a comparison of the student's measured abilities from subject to subject and from testing date to testing date (in this case from the end of grade 4B to the beginning of Grade 8B). An opportunity is afforded the observer to evaluate any test score in terms of both a modal and a traditional type grade equivalent. The difference in these two types of grade equivalents rests in the fact that the modal equivalent tends to minimize the effects of retardation and acceleration, thus representing an ideal goal for achievement. The traditional type grade equivalent is probably more typical of the usual situation in Indiana public schools.

A glance at the fourth grade line shows that this student is a little lower than the expected norm on most measured aspects when a modal type grade equivalent is used as criterion, but he is normal or above in all tested aspects when a traditional type grade equivalent is used as a criterion. The vertical dotted line represents the average of achievement test results, and illustrates the student's general level of achievement as measured by tests.

The line connecting chronological age with tested mental age slopes to the right, which indicates an I.Q. above 100. I.Q.'s under 100 would show this line sloping to the left. The more this line slopes to either the right or the left, the more the I.Q. deviates above or below 100, respec-

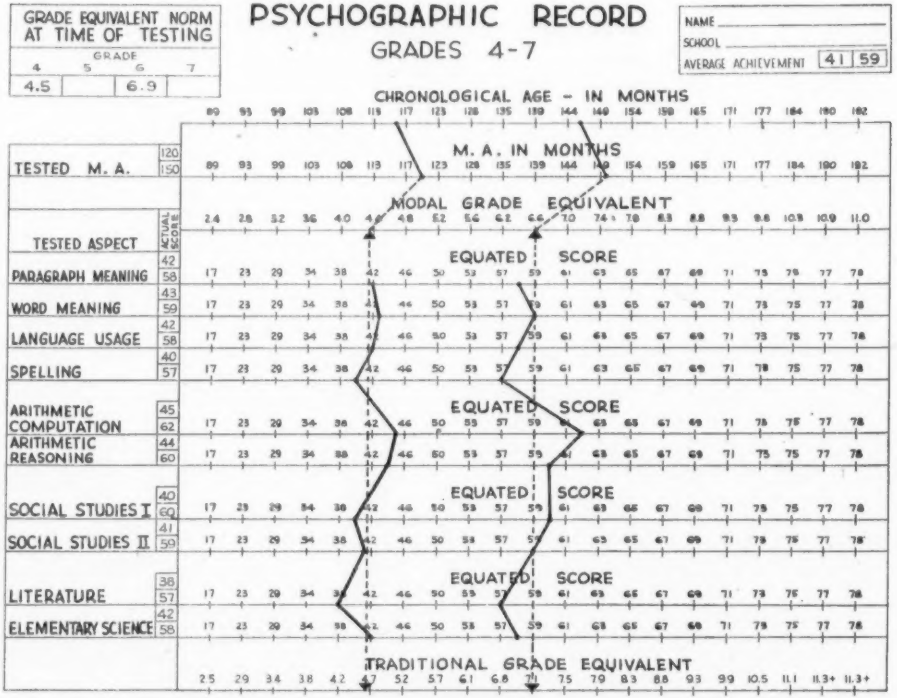

Fig. 1. Psychographic Record of an Elementary School Student's Tested Abilities

tively. A vertical line connecting these two points indicates an I.Q. of exactly 100.

In the hypothetical case under discussion here, the student does not have, either at the fourth or sixth grade level, the tested achievement suggested by his mental ability score. The increments between fourth and sixth grade lines suggest rather normal progress in this period in all tested aspects. This hypothetical student's tested achievement is best in arithmetic computation and worst in literature.

Figure 2 is a graphic record of the tested abilities of a hypothetical student at the eighth and ninth grade levels. It will be noted that the grade equivalent method of drawing comparisons has here been replaced by the centile scale method.

The non-language ability of this student tests slightly higher than his language ability. His tested general ability (intelligence) is somewhat above 50, the expectation for the average student. Nevertheless, one notices that tested achievement aspects deviate markedly from tested mental ability. Aspects of science, mathematical appreciation, certain interests, and social competency in personal economics appear to present the most favorable comparison with general ability. The preference record reveals a high interest in mechanical and scientific areas, and a low interest in the literary area. Lowest tested achievement appears in the case of effectiveness of English expression. The tested aspects appearing in Figure 2, and in Figure 3 which follows, are those aspects recommended to be tested in the suggested minimum testing program which will be discussed later.

Figure 3 shows the psychographic method of representing the tenth and twelfth grade student's tested abilities. Again the data are hypothetical. Centile norms are used at these grade levels.

The same general rules of interpretation apply in Figure 3 as in Figure 2. One very desirable feature has been added—the composite teacher rating scale. This should represent the pooled judgment of all the teachers who are familiar with the high school senior's ability and background. Such a rating is very valuable in the aspect of guidance which aims at projecting the student's chances of success in life after graduation.

Figure 1 is a part of a two-page guidance form, published by the Division of Research and Field Services, which is to be used primarily for educational guidance at the upper elementary level. The reverse page of this form offers space for recording other information about the student.

Figures 2 and 3 make up the inner pages of a four-page guidance form for high school students. The remaining pages of this form contain space for recording additional information which will be valuable in educational and vocational guidance.

The provision of these forms and the execution of the psychographs for each individual are part of the service offered to the public schools by the Division of Research and Field Services. The operation of this service, and its cost to the public schools, comes under the heading, *Plan IV*, which will be discussed later.

PSYCHOGRAPHIC RECORD

GRADES 8 AND 9

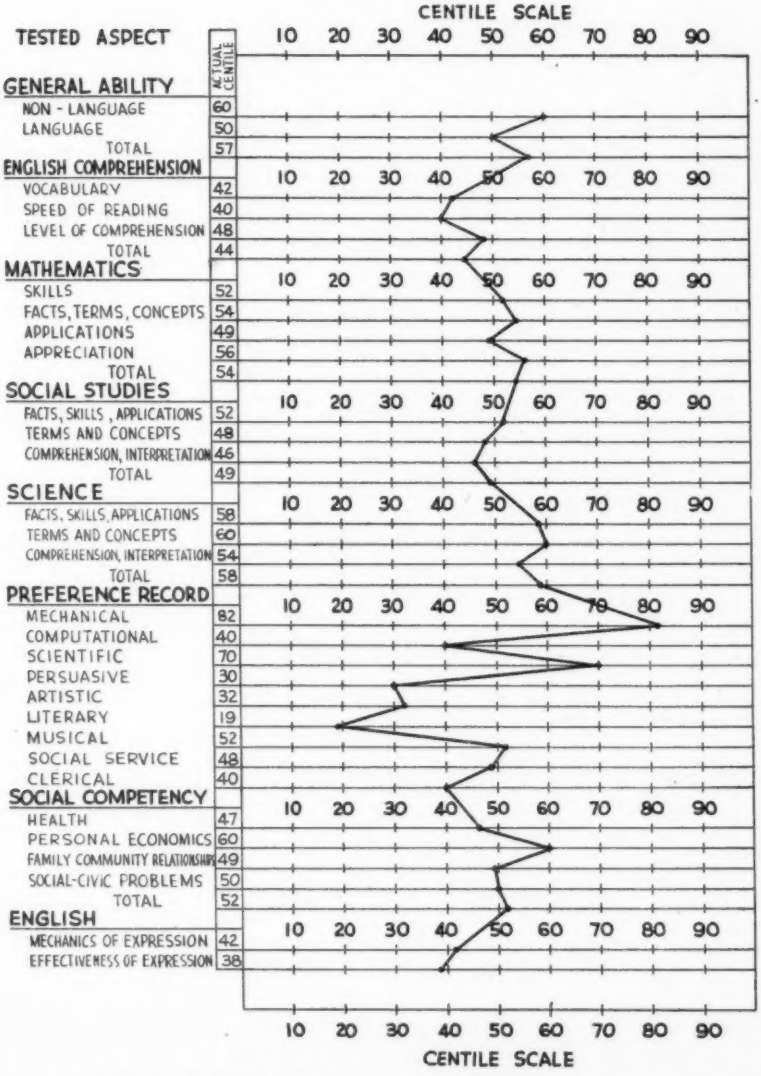

Fig. 2. Psychographic Record of a Junior High School Student's Tested Abilities

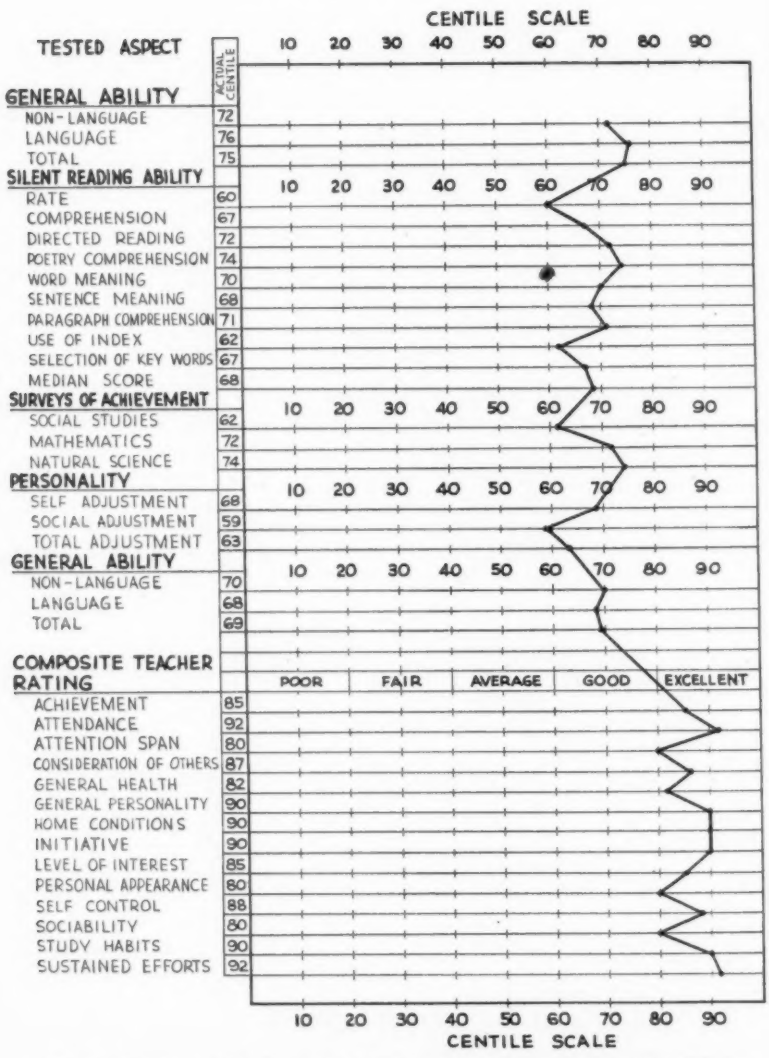

Fig. 3. Psychographic Record of a High School Student's Tested Abilities

Criteria for Selection of Tests

The experimentation which is being carried out by the Division of Research and Field Services is aimed primarily at determining what tests may be expected to measure up to a criterion of reliability and validity for school purposes. To this end, a recommended program is always subject to revision as the experimental findings indicate changes. The testing service staff, for example, hesitates to recommend the indiscriminate use of aptitude and personality tests in the general program, mainly because its experimentation has not conclusively indicated their value in the guidance program. It is highly possible that such tests will be permanently recommended as the field of experimentation is broadened and as the tests are improved.

The shortcomings of standardized tests of achievement are also recognized. The often-spoken criticism of achievement tests is that these tests fail to measure all of the desirable outcomes of instruction. When and if reliable and valid tests of concomitant learning are constructed and standardized, this staff will be among the first to recommend their inclusion in the general testing program. There are many indications at present that we are approaching this worth-while goal in the construction of tests. Even so, these new tests will serve only as worthwhile additions, and will not invalidate the present recommendations.

The Testing Bureau also feels that it is not necessary to measure the students in *all* grades every school year. Instead, it seems more appropriate to obtain measurements at the more critical points in the progress of the student. If the program is carried out as a continuous project, such practice will provide sufficient measurements to enable any counselor to determine the general trend of each student's efforts.

Outline of a Basic Program

With the above-mentioned qualifications in mind, the following minimum standardized testing program is suggested:

Grade 1—(Beginning of the year)

Reading Aptitude

Grade 2—(Middle of the year)

Mental Maturity
- (a) Non-language
- (b) Language
- (c) Total

Reading Achievement
- (a) Word recognition
- (b) Sentence reading
- (c) Paragraph reading

Grade 4—(Middle of the year)

Mental Ability

Arithmetic
- (a) Computation
- (b) Reasoning

Language Arts
- (a) Paragraph meaning
- (b) Word meaning
- (c) Language usage
- (d) Spelling

Social Studies
- (a) History
- (b) Geography

Literature

Elementary Science

Grade 6—(End of the year)

Mental Ability

Arithmetic
- (a) Computation
- (b) Reasoning

Language Arts
- (a) Paragraph meaning
- (b) Word meaning
- (c) Language usage
- (d) Spelling

Social Studies
- (a) History
- (b) Geography

Literature

Elementary Science

Grade 8—(End of the year)

Mental Maturity
- (a) Non-language
- (b) Language
- (c) Total

General Science
- (a) Facts, skills, applications
- (b) Terms and concepts
- (c) Comprehension and interpretation
- (d) Total

Reading Comprehension
- (a) Vocabulary
- (b) Speed of comprehension
- (c) Level of comprehension
- (d) Total comprehension

Social Studies
- (a) Facts, skills, applications
- (b) Terms and concepts
- (c) Comprehension and interpretation
- (d) Total

Mathematics
- (a) Skills
- (b) Facts, terms, concepts
- (c) Application
- (d) Appreciation
- (e) Total

Grade 9—(Middle of the year)

English Expression
- (a) Mechanics of expression
- (b) Effectiveness of expression

Test of Social Competency (not machine-scorable)
- (a) Health
- (b) Personal economics
- (c) Family and community relationships
- (d) Social-civic problems

Interests (recommended to be scored by students themselves)
- (a) Mechanical
- (b) Computational
- (c) Scientific
- (d) Persuasive
- (e) Artistic
- (f) Literary
- (g) Musical
- (h) Social service
- (i) Clerical

Grade 10—(Beginning of the year)

Silent Reading
- (a) Rate
- (b) Comprehension
- (c) Directed reading
- (d) Poetry comprehension
- (e) Word meaning
- (f) Sentence meaning
- (g) Paragraph comprehension
- (h) Use of index
- (i) Selection of key words

Mental Maturity
- (a) Non-language
- (b) Language
- (c) Total

Grade 12—(Middle of the year)

Survey of mathematics knowledge

Survey of science knowledge

Survey of social studies knowledge

Personality
- (a) Self adjustment
- (b) Social adjustment
- (c) Total adjustment

Mental Maturity
- (a) Non-language
- (b) Language
- (c) Total

Types of Testing Services Offered

It was established in the first part of this report that the testing facilities of the Division of Research and Field Services are available as an aid to the public schools in initiating and carrying out a standardized testing program such as the one suggested above. These services are strictly on a cost basis and may be utilized in part or in whole. Four

plans are therefore recommended as possible ways of utilizing these services in gaining the maximum value from testing data.

Plan I calls for the public school personnel to administer the tests, score the tests, determine individual norms, and construct psychographic profiles. Under this plan schools would provide their own scoring, but the services of the Division would be available in the functional aspect of helping to determine the number and type of tests to be ordered, and in helping with the general problem of how much or how little of the basic recommended program should be attempted by the individual school.

Plan II calls for the school to administer the tests and also process the results after the tests are scored. The Division would provide suggestions, make out test orders, and score all machine-scorable tests.

Plan III is similar to Plan II except that the Division, in addition to scoring the tests, places the individual norms on the machine-scorable answer sheets.

Plan IV relieves the public school of all responsibility except the administration of the tests and the scoring of non-machine-scorable tests. The Division of Research and Field Services under this plan would counsel with the public school in regard to the extent of testing to be desired, help with the test orders, score the tests, determine norms, and construct individual psychographic profiles for all tested levels from the fourth grade up.

An examination of the outline for a basic testing program reveals the policy of testing different grade levels at varying periods in the school year. This recommendation was designed especially to permit maximum efficiency in this outside service. When the demand for service is staggered throughout the year, the work involved in servicing the public schools will be better distributed, and the demand for immediacy will be alleviated. Thus the results in grades 4 and 12 could easily be returned to the public schools by the end of the second semester. This would allow ample time for a consideration of fourth grade testing abilities before the student enters the fifth grade, and would also allow ample time for twelfth grade results to be tabulated and made available to the colleges and industries that ask for them.

The administration of the sixth and eighth grade tests at the end of the year would allow an entire summer for processing before the ultimate utilization of the results in guidance at the seventh and ninth grade levels, respectively. The administration of a reading aptitude test at the beginning of grade 1 has the obvious purpose of providing information for the first grade teacher. The administration of a reading achievement test at the middle of the year for grade 2 provides information at a time when this information is highly desired by the second grade teacher and later by the third grade teacher. The suggested program is obviously better adapted to the situation wherein the annual promotion rather than the semi-annual promotion is the policy. Where the semi-annual promotion policy exists, there would of necessity have to be some readjustment for the irregular classes.

Costs of the Suggested Program

The Division of Research and Field Services is constantly being requested to make estimates of costs for standardized testing. In the preceding section of this report the cost of such services for separate tests was established. In the pages which follow, an attempt will be made to consider the cost of the suggested basic testing program both by separate grades and by various types of school organization.

For a 1-12 school system with an over-all enrollment of about 1,200, it is estimated that in each of Plans II, III, and IV, the services offered would save from 100 to 300 hours of teacher time per year. Because first year costs include the purchase of basic testing materials, the costs for the first year are heavier than for any one of the next four years. With reasonable care, test booklets for machine-scored tests will last for five years and can be used over and over again with separate answer sheets.

Table II gives the estimated costs of the recommended program per grade and per pupil for the first year and for each of the four subsequent years, allocated according to the type of service desired. The costs where the Division's services are included cover the scoring and processing of all machine-scorable tests. In general, this includes all but the tests at the first and second grade levels and two tests at the ninth grade level. Machine-scorable tests below the fourth grade level cannot be administered with reliable results. Also, some tests are not yet available in a machine-scorable edition.

The cost estimates in Table II cover every item necessary for carrying out the program except express charges on getting the tests from the publishers. In general, the estimates are based on an average enrollment of about 100 pupils per grade. They include the cost of enough basic supplies to test 50 pupils at one sitting, and enough expendable supplies to test any given number of pupils. Where the average enrollment per grade is less than 100, the per pupil cost would be slightly higher, and where the enrollment ranges from 100 to 199 the per pupil cost would tend to decrease. For schools with an average enrollment per grade of 200 or more it would probably be more expedient to purchase a duplicate set of basic supplies, thus providing for the testing of 100 pupils at any given time. This would not increase the per pupil estimates listed in Table II.

Another aspect of this table should be pointed out; the figures listed therein are not strictly additive. That is, one does not get an average cost for the program covering all of the twelve grades by adding up any column and dividing by the number of grades tested. For example, the same basic materials may be used in both grade 4 and grade 6; likewise, special pencils and other basic supplies may be used at all grade levels.

Comparison of these estimates with the suggested basic program will show the relationships between the number of tests administered at any grade level and the per pupil costs. In this respect, the more expensive testing occurs at the ninth grade level, where the tests recommended are rather complex. In determining the cost for testing in any single grade, the administrator needs only to determine first what service plan he wishes to follow and then to multiply the number of pupils enrolled in that grade by the per pupil cost listed at that level for the plan decided upon. This should give a reasonably accurate estimate of the total cost for any particular grade.

TABLE II. ESTIMATED COSTS OF THE RECOMMENDED PROGRAM PER GRADE AND PER PUPIL FOR THE FIRST YEAR AND FOR EACH OF FOUR SUBSEQUENT YEARS, ALLOCATED ACCORDING TO THE TYPE OF SERVICE DESIRED*

Grades Tested	PLAN I Schools Administer Tests and Process Data		PLAN II Schools Administer, Division Scores Tests Only		PLAN III Schools Administer, Division Provides Scores and Norms		PLAN IV Schools Administer, Division Scores and Draws Profiles	
	First Year	2nd-5th Year	First Year	2nd-5th Year	First Year	2nd-5th Year	First Year	2nd-5th Year
1	$ .05	$ .05	$ .05	$ .05	$ .05	$ .05	$ .05	$ .05
2	.12	.12	.12	.12	.12	.12	.12	.12
4	.32	.12	.45	.20	.53	.28	.58	.33
6	.32	.12	.45	.20	.53	.28	.58	.33
8	.28	.08	.47	.21	.63	.37	.70	.45
9	.48	.19	.58	.22	.60	.24	.69	.33
10	.17	.09	.31	.18	.39	.26	.44	.31
12	.35	.17	.48	.24	.54	.31	.59	.36

*Costs in this and succeeding tables are estimated from current catalogue quotations, and are subject to change.

Table III shows the estimated costs of the recommended program per pupil for the first year and for each of the four subsequent years, arranged according to various types of organization of grades and allocated according to the type of service desired. From the figures in Table III it may be seen that the most expensive unit, as far as testing is concerned, is that of the junior high school. This comes about as a result of the fact that two of the three grades in grades 7-9 are heavily tested, and the fact that the tests administered at these levels are rather expensive.

It is apparent that the six-grade elementary school can have a full testing program with all of the Division's services for as low as 28 cents per pupil tested for the first year and 21 cents per pupil for each of the next four years. If the school feels it cannot afford this amount, it may elect Plan I and carry out its testing program for about 16 cents per pupil tested in the first year and 10 cents per pupil tested in each of the next four years. If the money available for a testing program is more than the cost under Plan I, but less than the cost under Plan IV, either Plan II or Plan III may be elected.

A 7-9 grade junior high school may process its own tests and carry out the recommended program for about 39 cents per pupil tested the first year, and 14 cents per pupil tested in each of the next four years. The full service, including scoring of machine-scorable tests and execution of individual psychographs by the Division of Research and Field Services would cost about 68 cents per pupil tested the first year and 39 cents per pupil tested in each of the succeeding four years.

A full 1-12 grade system may process its own test results and carry out the testing program for a cost of 24 cents per pupil tested in the first year and 12 cents per pupil tested in each of the next four years. It may utilize the full facilities of the Division of Research and Field Services, thereby freeing an enormous amount of teacher time for further analysis of the data or for other activities, and carry out the program for 41 cents per pupil tested for the first year and 28 cents per pupil tested in each of the next four years.

As in the case of Table I, the costs listed in Table III are estimated on the basis of an average enrollment per grade of 100. This does not mean that all grades should contain 100 pupils. The usual trend of grade enrollments in the Indiana schools was considered in estimating these costs. For the average school, a fairly reliable total cost estimate may be obtained by totalling the pupils enrolled in each of the grades to be tested in any particular type of organization, and then by multiplying this total by the per pupil estimate listed for that organization, according to the desired service plan.

As an example, let us suppose that the plan of a high school which incorporates grades 9-12 has an enrollment of 82 in the ninth grade, 78 in the tenth grade, 79 in the eleventh grade, and 66 in the twelfth grade. Since the eleventh grade is not included in the suggested testing program, the enrollment at this level is disregarded. The combined enrollment of the ninth, tenth, and twelfth grades in our hypothetical example is 226. If the principal desires to take advantage of the complete service listed as Plan IV, he may estimate his total costs for the first year

TABLE III. ESTIMATED COSTS OF THE RECOMMENDED PROGRAM PER PUPIL TESTED FOR THE FIRST YEAR AND FOR EACH OF FOUR SUBSEQUENT YEARS, ARRANGED ACCORDING TO VARIOUS TYPES OF ORGANIZATION OF GRADES AND ALLOCATED ACCORDING TO THE TYPE OF SERVICE DESIRED

Grades Tested	PLAN I Schools Administer Tests and Process Data		PLAN II Schools Administer, Division Scores Tests Only		PLAN III Schools Administer, Division Provides Scores and Norms		PLAN IV Schools Administer, Division Scores and Draws Profiles	
	First Year	2nd-5th Year	First Year	2nd-5th Year	First Year	2nd-5th Year	First Year	2nd-5th Year
1-6	$ .16	$ .10	$ .21	$ .14	$ .25	$ .18	$ .28	$ .21
1-8	.18	.10	.25	.16	.32	.22	.35	.26
7-9	.39	.14	.51	.21	.60	.30	.68	.39
8-12	.32	.13	.44	.21	.53	.29	.59	.36
9-12	.34	.15	.42	.23	.48	.26	.54	.33
1-12	.24	.12	.31	.18	.37	.24	.41	.28

by multiplying 226 by 54 cents, which is the average figure for pupils tested when grades 9-12 form the integral organization. Thus his cost for the first year would be approximately $122. Multiplying 226 by 33 cents would give him an estimate of the cost for his program for each of the next four years, or about $74 per year. If this amount is too much for the school budget, he may then follow across the table until he finds a level of service which more nearly meets his budget. As an example, under Plan III his cost would be about $108 for the first year and $59 for each of the next four years; under Plan II, $95 for the first year and $52 for each of the next four years. If the principal should decide to score his own tests and process the results, his costs would be only $77 for the first year and $34 for each of the next four years. While these costs are only approximations, experience has shown that the estimates are not subject to a very large error. In fact, the estimates are generally slightly higher than the actual costs.

It should be pointed out again that the suggested testing program of testing only eight of the twelve grades, will, if carried out continuously from year to year, actually result in obtaining test results for *all* of the students enrolled in the school. With this feature in mind, it seems appropriate to present still another way of looking at costs, that is, to consider costs per student for *all students enrolled*, rather than on the basis of per student tested. Costs figured on this basis are considerably less than on the basis of per pupil tested, due to the fact that testing actually takes place in only eight of the twelve grades.

Table IV shows the estimated costs of the recommended program per pupil enrolled for the first year and for each of four subsequent years, by grade organization and allocated according to the type of service desired. In the school system with a normal enrollment trend, total estimations made from this table will very closely approximate those made from Table III, although it should be stated that there is more chance for error in considering *all* the pupils than in considering *only those tested.*

In reading this table it will be noted that, where the schools do their own testing and process their own results, prices for the first year range from 10 cents per pupil enrolled in the six-grade elementary school to 26 cents per pupil enrolled in the 7-9 school, the 8-12 school, and the 9-12 school. For the second year the costs per pupil range considerably lower. Going to the other extreme, where the full services of the Division are utilized, costs per pupil enrolled for the first year range from 18 cents in the six-grade elementary school to 48 cents per pupil in the 8-12 school. For each of the next four years costs range from 14 cents per pupil in the six-grade elementary school to 26 cents per pupil in the junior high. When every possible service of the Division is utilized, the suggested testing program may be carried out in the 1-12 system for only about 28 cents per pupil the first year and 19 cents per pupil for each of the next four years, when the cost is based on total enrollment.

Looking at these costs in another way, a five-year continuous testing program in the 1-12 system on a total enrollment basis would average only about 20 cents a pupil each year. Schools in Indiana spend from $40 a pupil to well over $200 a pupil each year for in-

TABLE IV. ESTIMATED COSTS OF THE RECOMMENDED PROGRAM PER PUPIL ENROLLED FOR THE FIRST YEAR AND FOR EACH OF FOUR SUBSEQUENT YEARS, ARRANGED ACCORDING TO VARIOUS TYPES OF ORGANIZATION OF GRADES AND ALLOCATED ACCORDING TO THE TYPE OF SERVICE DESIRED

Grades Tested	PLAN I Schools Administer Tests and Process Data		PLAN II Schools Administer, Division Scores Tests Only		PLAN III Schools Administer, Division Provides Scores and Norms		PLAN IV Schools Administer, Division Scores and Draws Profiles	
	First Year	2nd-5th Year	First Year	2nd-5th Year	First Year	2nd-5th Year	First Year	2nd-5th Year
1-6	$ .10	$ .07	$ .14	$ .09	$ .17	$ .12	$ .18	$ .16
1-8	.11	.06	.16	.10	.20	.14	.22	.16
7-9	.26	.09	.32	.14	.38	.20	.44	.26
8-12	.26	.11	.36	.17	.42	.24	.48	.29
9-12	.26	.11	.33	.16	.37	.20	.42	.25
1-12	.16	.08	.20	.12	.24	.16	.28	.19

structional purposes. With the new increase in teacher minimum salary, these costs will be considerably higher than the range just quoted. Surely it is logical to conclude that no school can afford to ignore the possible uses for this type of evaluative data when the cost of procuring such data is so insignificant in comparison to instructional and other outlays.

Requests for further information, and for any assistance in matters pertaining to standardized testing will be expeditiously considered and fullfilled. Address all inquiries of this nature to:

Division of Research and Field Services
School of Education, Indiana University
Bloomington, Indiana

BULLETINS IN THE FIELD OF EDUCATION, INDIANA UNIVERSITY

The Bulletin of the School of Education, Indiana University, was first published in 1924 and has appeared regularly since that time. Research studies of interest to educators, proceedings of conferences held, and bibliographies of educational materials have been the principal fields touched upon in these bulletins. A complete list of the bulletins may be obtained from the School of Education upon request. The studies included in the present volume and in the two volumes immediately preceding it in date are listed below. Unless otherwise noted, these may be obtained for 50 cents each from the Indiana University Bookstore, Bloomington, Indiana.

One Hundred Fifty Years of Arithmetic Textbooks. By Henry Lester Smith, Merrill T. Eaton, and Kathleen Dugdale. Vol. XXI, No. 1, 1945. 153 p.

Bibliography of School Buildings, Grounds, and Equipment, Part V. By Henry Lester Smith and Harold E. Moore. Vol. XXI, No. 2, 1945. 79 p.

School Library Personnel in Indiana. By Margaret I. Rufsvold. Vol. XXI, No. 3, 1945. 80 p.

Source Material Relating to the Development of Education in Indiana. By Velorus Martz and Henry Lester Smith. Vol. XXI, No. 4, 1945. 95 p.

Bibliography of School Buildings, Grounds, and Equipment, Part VI. By Henry Lester Smith and Harold E. Moore. Vol. XXI, No. 5, 1945. 73 p.

Analysis of the Proficiency in Silent Reading of 15,206 Sixth Grade Pupils in 648 Schools in Indiana. By Henry Lester Smith and Merrill T. Eaton. Vol. XXI, No. 6, 1945. 52 p.

Analysis of the Proficiency in Silent Reading of 11,424 Sophomore Pupils in 243 High Schools in Indiana. By Henry Lester Smith and Merrill T. Eaton. Vol. XXII, No. 1, 1946. 51 p.

Analysis of the Spelling Proficiency of 82,833 Pupils in Grades 2 to 8 in 3,547 Teaching Units of the City Schools of Indiana. By William H. Fox and Merrill T. Eaton. Vol. XXII, No. 2, 1946. 50 p.

Analytic Study of the Student Personnel of the School of Education, Indiana University, 1931-1942. By Henry Lester Smith and Oscar P. Rausch. Vol. XXII, No. 3, 1946. 31 p.

School Building Planning and Related Problems: Proceedings. Vol. XXII, No. 4, 1946. 83 p.

One Hundred Fifty Years of Grammar Textbooks. By Henry Lester Smith, Kathleen Dugdale, Beulah Faris Steele, and Robert Stewart McElhinney. Vol. XXII, Nos. 5 and 6, 1946. 199 p.

Spelling Proficiency in Township Schools in Indiana. By William H. Fox. Vol. XXIII, No. 1, 1947. 32 p.

The Language and Mental Development of Children. By Ruth G. Strickland. Vol. XXIII, No. 2, 1947. 31 p.

Testing Services Offered by the Division of Research and Field Services. By William H. Fox. Vol. XXIII, No. 3, 1947. 31 p.